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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

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DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/818,324

Applicant(s)

IWAMOTO ET AL.

Examiner

Melvin Curtis Mayes

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-15 and 22-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-15 and 22-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

(1)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(2)

Claims 13-15 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calhoun et al. 5,275,856 in view of Chung 6,399,178.

Calhoun et al. disclose a method of interconnecting electrodes of two electrical devices such as circuit and a printed circuit board comprising: providing an electrically conductive adhesive tape comprising a releasable carrier web having a low-adhesion face (such as paper having polymeric coating) bearing thereon an adhesive layer; applying the tape to one substrate; removing the carrier web; and applying the second substrate. The adhesive can be a thermosetting adhesive and useful materials which can be blended into the adhesive include fillers and woven and nonwoven fabric. The electrically conductive adhesive tape is made by coating and curing adhesive on the carrier web, laser perforating the adhesive layer, and applying slurry containing conductive particles and binder into the perforations (col. 2-9).

Chung teaches that an adhesive preform film or sheet of thermosetting adhesive for bonding electronic components is dried or B-staged to facilitate handling and lamination to a device or substrate. Chung teaches that fillers that are added to enhance the thermal conductivity of the adhesive include alumina, etc. (col. 8, lines 46-55, col. 10, lines 31-41).

Art Unit: 1734

It would have been obvious to one of ordinary skill in the art to have bonded an integrated circuit and printed circuit board in the method of Calhoun et al. by curing the adhesive because Calhoun et al. disclose that the adhesive can be a thermosetting adhesive and thermosets bond by curing. Curing the adhesive to a B-stage before laser perforating to provide the adhesive layer with perforations for the conductive slurry, as claimed in Claim 14, would have been obvious to one of ordinary skill in the art, as taught by Chung to facilitate handling of the thermosetting adhesive yet leave the thermosetting adhesive not completely cured to enable bonding of the integrated circuit and printed circuit board.

Providing the polymeric release coating on the paper as Teflon, as claimed in Claim 22, would have been obvious to one of ordinary skill in the art as a material conventionally used as a release coating.

It would have been obvious to one of ordinary skill in the art to have provided the filler blended into the thermosetting adhesive as thermally conductive particle filler, as taught by Chung, to enhance the thermal conductivity of the adhesive. By providing the filler as alumina, as taught by Chung to enhance thermal conductivity, a particle filler that is thermally conductive and electrically non-conductive, as claimed in Claims 26 and 27, is obviously provided.

(3)

Claims 13 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi et al. 4,740,657.

Tsukagoshi et al. disclose a method for connecting conductors such as integrated circuits with wiring substrates comprising: forming an adhesive film of adhesive composition containing electroconductive particles on a separator made of paper or film treated with release treatment;

Art Unit: 1734

preliminarily adhering the adhesive film to one of the conductors; peeling the separator; placing the other conductor on the adhesive film; and bonding by heat. Tsukagoshi et al. disclose that the adhesive composition can be thermosetting and disclose that in the adhesive film, it is possible to use a core material such as non-woven fabric for reinforcing the adhesive and to provide spacer particles such as electroconductive nickel particles or insulating silica powder (col. 1, lines 9-17, col. 3, lines 38-58, col. 8, line 10 – col. 10, line 38, col. 11, lines 14-34, Example 37 and 38).

It would have been obvious to one of ordinary skill in the art to have bonded the integrated circuit and wiring substrate by curing the adhesive composition because Tsukagoshi et al. disclose that the adhesive composition can be thermosetting and thermosets bond by curing.

Providing the release treatment as silicon, Teflon or graphite, as claimed in Claim 22, would have been obvious to one of ordinary skill in the art as materials conventionally used for release treatment of paper or film.

By providing spacer particles such as nickel particles or silica powder in the adhesive film, particle filler that is thermally conductive and/or electrically non-conductive and intermixed with the thermoset, as claimed in Claims 26 and 27, is obviously provided.

Response to Arguments

(4)

Applicant's arguments filed December 18, 2002 have been fully considered but they are not persuasive.

Applicant argues that neither Calhoun nor Tsukagoshi teach or suggest a base layer comprising wire or solder paste through conductors or contemplate a conventional solder paste

Art Unit: 1734

formulation comprising a metal or alloy powder, a rosin compound, a rheological additive, a solvent or solvent mixture, a surfactant mixture and/or a buffer or neutralizing agent. Applicant argues that there is no motivation, reason or suggestion to combine the Calhoun and Chung references.

(5)

Applicant claims in Claim 13, “the base layer comprising wire or solder paste through conductors, or the base layer comprising a fiber mesh material impregnated with a thermoset.” Thus according to Claim 13 the base can either comprise wire through conductors, comprise solder paste through conductors **or** comprise a fiber mesh material impregnated with a thermoset. It is not required in Claim 13 that the through conductors be either wire or solder paste. A base layer comprising fiber mesh material impregnated with a thermoset and any type of conductor is encompassed by Claim 13.

Calhoun et al. disclose the use of thermosetting adhesive into which can be blended woven or nonwoven fabric, while Tsukagoshi et al. disclose that in a thermosetting adhesive film, it is possible to use a core material such as non-woven fabric for reinforcing the adhesive. Thus Calhoun et al. and Tsukagoshi et al. each suggest a base layer of fiber mesh (fabric) impregnated with a thermoset, as encompassed by Claim 13.

Chung is pertinent because the reference teaches that an adhesive preform film or sheet of thermosetting adhesive for bonding electronic components is B-staged to facilitate handling and lamination to a device or substrate and teaches that fillers that are added to enhance the thermal conductivity of the adhesive include alumina, etc. (col. 8, lines 46-55, col. 10, lines 31-41). Chung provides motivation to B-stage the thermosetting adhesive of Calhoun, the

Art Unit: 1734

motivation being to facilitate handling and lamination to a device or substrate and provides motivation for providing alumina as the filler in the adhesive of Calhoun, the motivation being to enhance the thermal conductivity of the adhesive. To combine the references, it is not required that Chung needs or desires a sacrificial layer, as argued.

With respect the embodiment encompassed by Claims 13-15, wherein the base layer comprises solder paste through conductors, Calhoun discloses applying slurry containing conductive particles into the perforations. According to Calhoun, the slurry can contain conductive metal particles such as silver or nickel with organic binder and toluene (solvent) (col. 3, lines 38-52, see Examples). This slurry of Calhoun can be considered a "solder paste," as Umaba 5,373,786, cited of interest, sets forth that "solder paste" is a paste of particles of solder, binder and solution (col. 1, lines 20-22).

There is no indication from the present specification that "solder paste" is limited to a formulation comprising a metal or alloy powder, a rosin compound, a rheological additive, a solvent or solvent mixture, a surfactant mixture and/or a buffer or neutralizing agent, as argued. If the term "solder paste" is known in the art as this formulation only, Applicant should provide sufficient evidence that this is the formulation to which is being referred when the term "solder paste" is used in the claims.

Conclusion

(6)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Umaba teaches that solder paste is a paste of solder, binder and solution (col. 1, lines 20-22).

(7)

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


(8)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 703-308-1977. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

Art Unit: 1734

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
February 25, 2003